



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,588	04/15/2004	Osamu Machida	H64-169096M/MNN	6643
21254	7590	09/08/2006	EXAMINER	
MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817			FEGGINS, KRISTAL J	
			ART UNIT	PAPER NUMBER
			2861	

DATE MAILED: 09/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/824,588	Applicant(s) MACHIDA ET AL.	
	Examiner K. Feggins	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2,6 and 23-24 is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7-12 and 14-22 is/are rejected.
- 7) ☐ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 9-12, 14, 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al. (US 2002/0174542 A1).

Watanabe et al. disclose the following claimed limitations:

- * regarding claims 1 & 19, an ink jet head (Abstract);
- * a chamber plate/side walls of element 3/ comprising a plurality of pressurizing chambers/3/ formed therein for storing an ink (figs 1-2, para 0051-0052);
- * a vibrating plate/22/ bonded to the chamber plate/side walls of chamber, 3/;
- * a housing/7, 10 & 11/ having an ink flow path through which an ink is supplied into the pressurizing chambers/3/ (fig 2);
- * an orifice/14/ through which an ink is ejected from the pressuring chambers/3/ (para 0051-0052, fig 2);
- * a longitudinal vibration mode piezoelectric element/23/ for generating pressure under which an ink droplet is ejected through the orifice/14/, the longitudinal vibratin mode piezoelectric element being connected to a structure other than the chamber plate, wherein a thickness of the vibrating plate/22/ is from 5mμ to 10mμ /1 to 7μm/ (para 0053-0055 & 0057, figs 1-2);

* regarding claim 9, wherein the longitudinal vibration mode piezoelectric element/23/ expands or contracts/deformation/ when a potential difference is applied to the piezoelectric element (para 0016, 0025).

* regarding claim 10, a plurality of longitudinal vibration mode piezoelectric element/23/ (see fig 1).

* regarding claims 11 & 20, wherein the longitudinal vibration mode piezoelectric elements/23/ are disposed at an equal interval (see fig 1).

* regarding claims 12 & 21, a piezoelectric element fixing member/25, insulation/ for connecting the longitudinal vibration mode piezoelectric elements to each other (see fig 1) /the insulation layer connects to each of the piezo elements, 23/.

*regarding claim 14, further comprising, an elastic adhesive/insulator, 25/ disposed between the longitudinal vibration mode piezoelectric element and vibrating plate (para 0053, fig 1).

3. Claims 5, 15, 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura et al. (US 6,945,632 B2).

Nakamura et al. disclose the following:

Art Unit: 2861

- * regarding claim 5, an ink jet type droplet ejection device (Abstract),
- * an ink jet head/1/ (figs 1& 2);
- * an ejection substrate disposed opposed to the ink jet head;
- * a mechanism/carriage/ for moving one of the ink jet head and the ejection substrate/11/ with respect to the other (fig 1);
- * wherein the ink jet head/1/ comprises a chamber plate/side walls of chamber/ comprising a plurality of pressurizing chambers formed therein for storing an ink (figs 3-11);
- * a vibrating plate/31/ having a thickness of from 5 .mu.m to 10µm bonded to the chamber plate/side walls of chamber/ (col 10, lines 53-67, figs 3-11);
- * a housing having an ink flow path through which an ink is supplied into the pressurizing chambers (figs 3-11);
- * an orifice/23/ through which an ink is ejected from the pressurizing chambers and a longitudinal vibration mode piezoelectric element/32/ for generating pressure under which an ink droplet is ejected through the orifice, the longitudinal vibration mode piezoelectric element being connected to a structure other than the chamber plate (col 10, lines 53-67, figs 3-11).
- * regarding claim 15, a plurality of longitudinal vibration mode piezoelectric element/32/ (see figs 3-11).

Art Unit: 2861

* regarding claim 16, a piezoelectric element fixing member/insulating member, 35/ for connecting the longitudinal vibration mode piezoelectric elements to each other (see fig 7).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (US 2002/0174542 A1) in view of Goto et al. (US 2003/0067525 A1).

Watanabe et al. does not disclose the following:

* regarding claim 4, wherein a solution having a viscosity of from 5 to 25 mPa.s is ejected.

Goto et al. disclose the following claimed limitations:

* regarding claim 4, wherein a solution having a viscosity of from 5mPa.s to 25 mPa.s/1 to 30mPa.s/ is ejected for the purpose of allowing a high quality image to be recorded with good coloring.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a a solution having a viscosity of from 5 to 25 mPa.s/1 to 30mPa.s/ is ejected as taught by Goto et al. into Watanabe et al. (US

Art Unit: 2861

20020174542 A1) for the purpose of allowing a high quality image to be recorded with good coloring.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (US 2002/0174542 A1) in view of Iric et al. (US 2002/0180843 A1). **Watanabe et al. (US 20020174542 A1) disclose all of the claimed limitations except for the following:**

* regarding claim 3, wherein the vibrating plate comprises a metal.

Iric et al. disclose the following:

* regarding claim 3, wherein the vibrating plate comprises a metal (para 0184) for the purpose of providing an inexpensive piezoelectric element having a high functionality.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a vibrating plate comprising a metal, as taught by Iric et al. into Watanabe et al for the purpose of providing an inexpensive piezoelectric element having a high functionality.

7. Claims 17 & 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (US 2002/0174542 A1).

Watanabe et al. disclose the following claimed limitations:

* regarding claims 17 & 22, wherein a thickness of the vibrating plate is from 1 to 7 μ m (para 0053-0055 & 0057, figs 1-2);

Art Unit: 2861

Watanabe et al. do not disclose the following:

* regarding claims 17 & 22, wherein a thickness of the vibrating plate is from 7 to 10 mμ;

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a thickness of the vibrating plate is from 7 to 10mμ, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art for the purpose of providing an improved vibration plate. *In re Aller, 105 USPQ 233.*

Range

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a thickness of the vibrating plate is from 7 to 10mμ, as taught by Watanabe et al. for the purpose of providing an improved vibration plate

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 6,945,632 B2) in view of Iric et al. (US 2002/0180843 A1).

Nakamura et al. disclose all of the claimed limitations except for the following:

* regarding claim 7, wherein the vibrating plate comprises a metal.

Iric et al. disclose the following:

* regarding claim 7, wherein the vibration plate is formed by a metal (para 0184) for the purpose of providing an inexpensive piezoelectric element having a high functionality.

Art Unit: 2861

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a vibration plate that is formed by a metal, as taught by Iric et al. into Nakamura et al. for the purpose of providing an inexpensive piezoelectric element having a high functionality.

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 6,945,632 B2) in view of Goto et al. (US 2003/0067525 A1).

Nakamura et al. disclose all of the claimed limitations except for the following:

* regarding claims 8, wherein a solution having a viscosity of from 5mPa.s to 25 mPa.s is ejected.

Goto et al. disclose the following claimed limitations:

* regarding claims 8, wherein a solution having a viscosity of from 5 to 25 mPa.s/1 to 30mPa.s/ is ejected for the purpose of allowing a high quality image to be recorded with good coloring.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a solution having a viscosity of from 5 to 25 mPa.s/1 to 30mPa.s/ is ejected as taught by Goto et al. into Nakamura et al. for the purpose of allowing a high quality image to be recorded with good coloring.

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 6,945,632 B2) in view of Watanabe et al. (US 2002/0174542 A1).

Nakamura et al. disclose all of the claimed limitations except for the following:

* regarding claim 18, wherein a thickness of the vibrating plate is from 7 to 10 μ m

Watanabe et al. disclose the following:

* regarding claim 18, wherein a thickness of the vibrating plate is from 7 to 10 μ m/1 to 7 μ m/ (para 0053-0055 & 0057, figs 1-2) for the purpose improving the reliability of the print head.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a thickness of the vibrating plate is from 7 to 10 μ m, as taught by Watanabe et al. into Nakamura et al. for the purpose of improving the reliability of the print head.

Allowable Subject Matter

11. Claims 2, 6, 13 & 23-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

12. Applicant's arguments filed 6/21/2006 have been fully considered but they are not persuasive.

Regarding Applicant argument that the references (Watanabe/Nakamura) does not teach "a longitudinal vibration mode piezoelectric element for generating pressure under which an ink droplet is ejected through the orifice, the longitudinal vibration mode piezoelectric element being connected to a structure other than the chamber plate is

Art Unit: 2861

noted. However, the references (Watanabe/Nakamura) does disclose a longitudinal vibration mode piezoelectric element that is connected to another structural element, such as the insulating layer (see fig 1, item 25/fig 3, item 35, respectively). The longitudinal vibration mode piezo is also connected to the insulating layer.

Regarding Applicant's argument that Watanabe/Nakamura does not disclose a longitudinal vibration mode involving the direct use of "expansion and contraction" of the piezoelectric element for deformation of the vibration plate is noted. However, this argument is moot, because these are features/limitations that are not claimed. Furthermore, although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Regarding Applicant's argument that Watanabe does not disclose the thickness of the vibrating plate is from 5 to 10 micro meters is noted. However, Watanabe does disclose the range from 5 to 10 micro meters and it would have been obvious at the time of the invention to one of ordinary skill in the art to discover the optimum or workable ranges involves only routine skill in the art.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication With The USPTO

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Feggins whose telephone number is 571-272-2254. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patel Vip can be reached on 571-272-2458. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


K. FEGGINS
PRIMARY EXAMINER